MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

EME1016 – APPLIED STATICS

(ME)

8 OCTOBER 2015
9:00 a.m - 11:00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of **6** pages with **4** Questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

Question 1(a)

A *Fink roof truss* is loaded as shown in **Figure Q1 (a)**. Determine the force in member ***GH*** by the method of section and state if the member is in tension or compression.

[12 marks]

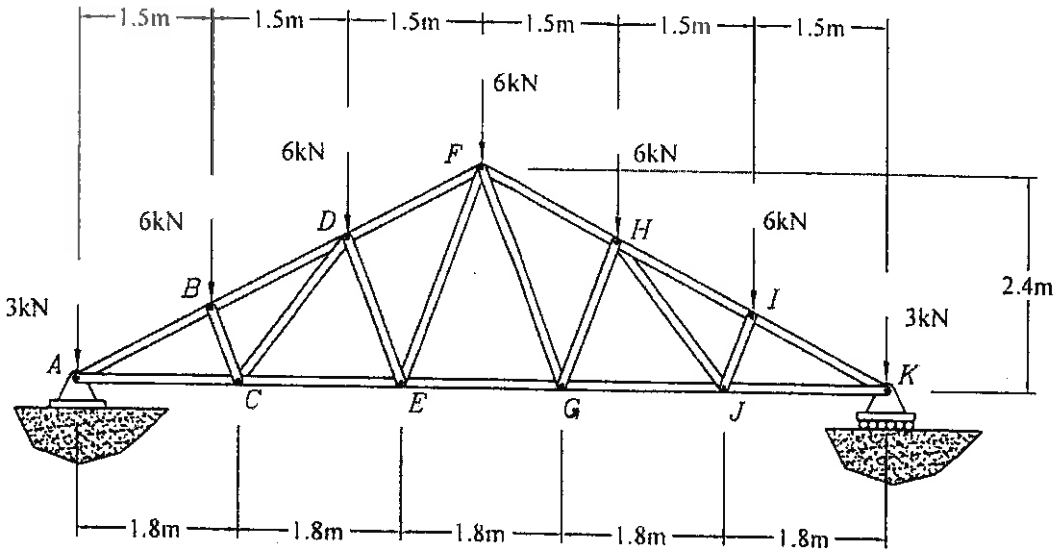

Figure Q1 (a)

Continued.....

Question 1(b)

Arm *BCD* is connected by pins to crank *AB* at *B* and to collar at *C* as shown in **Figure Q1 (b).** Neglecting the effect of friction, determine the couple ***M*** required to hold the system in equilibrium.

[13 marks]

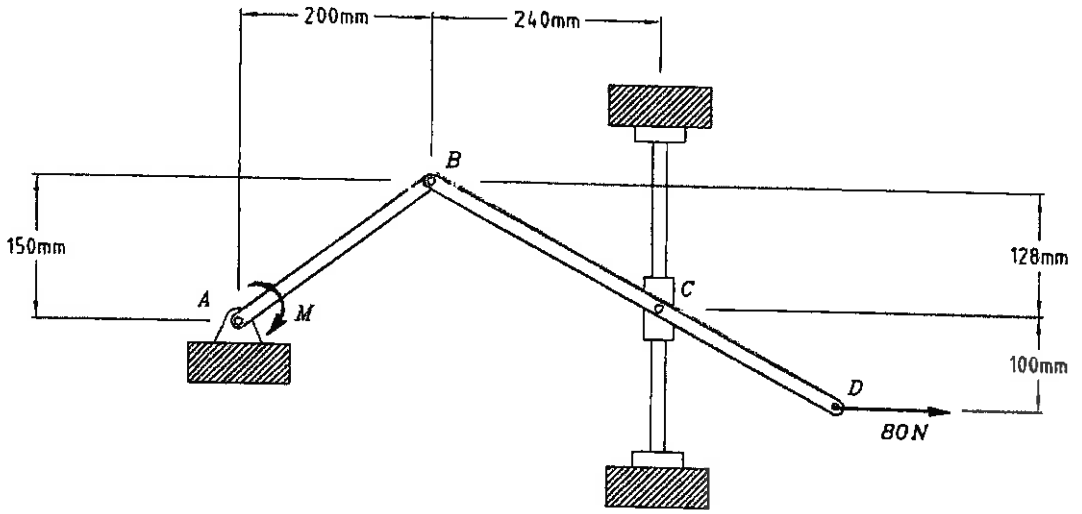

Figure Q1 (b)

Continued.....

Question 2

Draw the shear and bending moment diagrams for the beam AD as shown in **Figure Q2**. Show detailed steps of all calculation.

[25 marks]

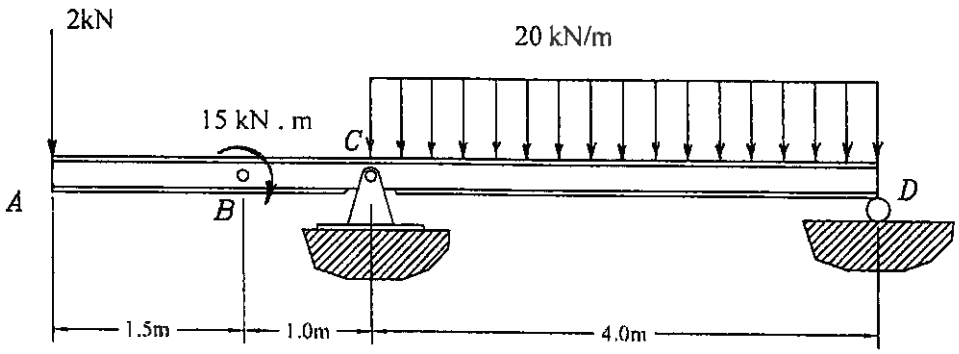

Figure Q2

Continued.....

Question 3:

(a) Locate the centroid ($\bar{x}$, $\bar{y}$) of the shaded area as shown in **Figure Q3**.

[12 marks]

(b) Determine the moment of inertia for the shaded area about the x and y axes (I_x & I_y) as shown in **Figure Q3**.

[13 marks]

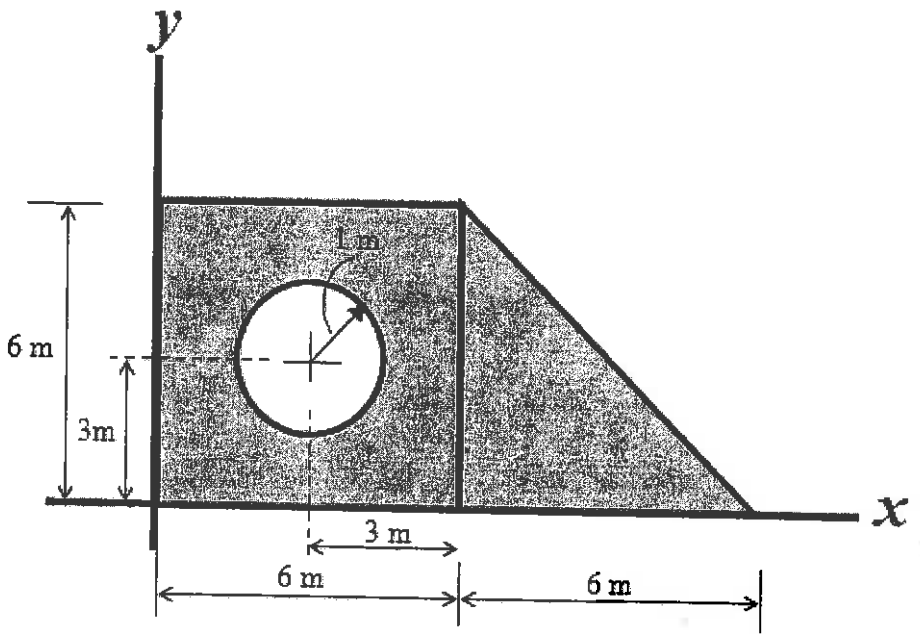

Figure Q3

Continued.....

Question 4:

Figure Q4 shows a block of weight W is being pulled up the inclined plane of slope α using a force P. The coefficient of friction of the contact surface is μ. If P acts at the angle ϕ as shown in **Figure Q4**,

(a) Show that for slipping to occur, $P = W\dfrac{\sin(\alpha+\theta)}{\cos(\phi-\theta)}$ where $\theta = \tan^{-1}\mu$.

[20 marks]

(b) Determine the force P, if the weight of the block is 50kg and the coefficient of friction, μ is 0.25. Assume $\alpha = 25°$ and $\phi = 35°$. **[5 marks]**

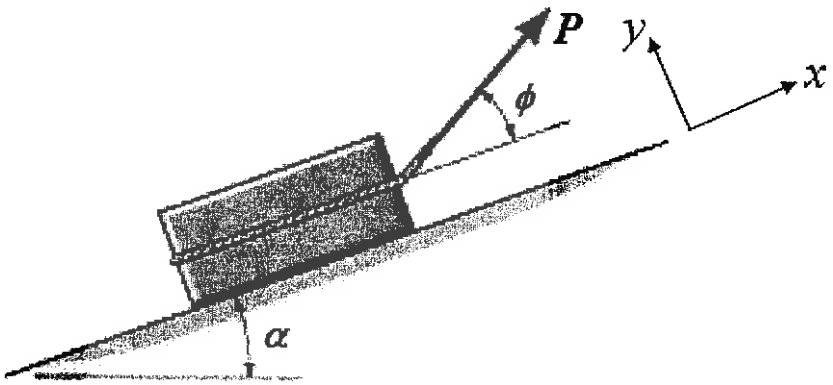

Figure Q4

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